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MAEDLERISPHAERA ARABICA A NEW SPECIES OF CHAROPHYTA FROM UPPER CRETACEOUS OF SOUTHEASTERN IRAQ

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INTRODUCTION

The present work is a complementary part of an effort being carried out by the authors to correlate the Mesozoic deposits of Southern Iraq.

Samples containing charophytes were obtained from deep well cuttings deposited at the Basrah Petroleum Company , Zubair. The well preserved gyrogonites presented in this study were obtained from the BPC well Zubair no. 8. The treatment of the samples was carried outby the junior author during his Ph.D. researches (1967-1971) at the Imperial College of Science and Technology, London, England. Additional examination of samples from several deep well cuttings, drilled by the Basrah Petroleum Company and Iraq National Oil Company (INOC) in southern Iraq, was carried out by the senior author (1974-1975) who also participated in identifying the fossil charophytes and preparing the systematic paleontology. The paleon-tological aspects for microbiostratigraphic correlations of the non-marine deposits is rather successfully used in many European and American coun-tries . However, such a type of research is almost new for Iraq and therefore our work has been beset with difficulties such as the absence of type mater-ials, the absence of standard non- marine sections and literature. The gyrog-onite species cited herein were from two closely spaced samples, Zb 7415 and Zb 7405 from the BPC/Zb 8 .Though sample Zb 7405 contains ,assoc-iated with charophytes, rare specimens of genus *Nezzazatinella* Darmoian (in preparation) which is the index fossil of the Miliolidae Limestone Bed, Shat Al Arab Formation in the Ratawi and Luhais subsurface sections ,it is here considered as still uncertain belonging. Detailed stratigraphic descri-

ption of the Miliolidae Limestone Bed may be found in Darmoian 1974.
we are most grateful to Drs, J. Karczewska and M .Ziembinska - Tworzydlo of the Warsaw University , Poland for checking the material. However ,the views given in this paper are those of the authors and they are alone responsible. We are also thankful to Mr. Setrak M . Vartanian of the Iraq National Oil Company for his kindly preparing the drawings .

SYSTEMATIC PALEONTOLOGY

The terminology and abbreviations employed here are the same as in Karczewska and Ziembinska- Towrzydlo (1969 , 1972) .The slides containing the holotype , paratypes and not illustrated specimens are in the personal collection of the authors.

Genus MAEDLERISPHAERA Horn Af Rantzien , 1959

Maedlerisphaera arabica n. sp. Figures 1 to 4

Material :

Fifteen well preserved specimens ,.

Holotype :

No . Zb / Char / 7405 /3 ; drilled depth of 7405 ft .

Paratypes

No. Zb/Char/7405/1-2,4 ; drilled depth of 7405 ft.

Cent .Labs. Zb/Char/7405	LPA in mm	LED in mm	ISI	AND in mm	ANI	NC	Width conv at EA in mm
1	0.44	0.37	118	0.20	46	7	0.063
2	0.40	0.34	118	0.20	50	8	0.056
3	0.44	0.36	122	0.20	46	8	0.056
4	0.44	0.36	122	0.22	50	7	0.060
5	0.44	0.36	122	0.20	46	7	0.052
6	0.40	0.36	111	0.21	50	8	0.060
7	0.4o	0.34	117	0.17	42	7	0.050

Note :

LPA = Length of the polar axis ,LED =Largest equatorial diameter, ISI Isopolarity index, AND = Distance from the apical pole to the LED as calculated along the polar axis ,ANI = Anisopolarity index, NC= Number of convolutions in the lateral view , EA = Equatorial axis .

Description

Gyrogonites middle- sized ,prolate spheroidal to subprolate (ISI–111–122) and ellipsoidal (ANI 42–50) ; apically widely and basally narrowly rounded (apical pole occasionally crushed),7–8 slightly convex or flat convolutions with narrow intercellular furrows visible in lateral view ; spirals narrowed in the apical periphery ;apical poles with low apical rosette and the spirals contact at its centre ; basal poles with small pentagonal opening surrounded by slightly widened ends of the spirals .

Remarks

Maedlerisphaera arabica n. **sp.** shows similarity to immature gyrogonites of *Chara ulmensis* Straub 1952, described as *Maedlerisphaera ulmensis* Straub 1952),n. comb. by Hanning af Rantzien (1959); and gyrogonites of *Maedlerisphaera pseudoulmensis* Karczewska and Zeimbinska . Tworzydlo, 1972. However, it differs from the first in smaller dimensions and lesser number of convolutions, and from the second it differs in lesser number of convolutions, wider convolutions at the equatorial axis and in the shape of summits and bases.

Occurrence

The age of the type sample (Zb7405) is not known in exactness yet. It was found associated with rare *Nezzazatinella* Darmoian (op. *cit.*) and (caved) marine planktonic microfossils. The interval above this horizon (drilled depths 7400–7385) contains abundant Miliolidae, rare planktonic micro fauna and two specimens of *Praeglobotruncana helvetica* (Bolli).This interval is followed by beds which are proved to be of Coniacian age (Darmoian, 1972, 1974). The horizon which contains the sample Zb7415 is in the Mish-

rif Formation (BPC, Internal Reports). According to latest informations, the upper part of the Mishrif Formation is of Lower Turonian age (L.Brun, 1970, ELF unpub. report, 03-D-31, n.0/410 R). It is therefore concluded that the age of *Maedlerishaera arabica* is older than Coniacian and younger than the Lower Turonian. The following additional gyrogonites were identified in this study; *Aclistochara bransoni* Peck, *A. cylindrica* Peck, *A. jonesi* Peck, *A. sp. aff. A. obovata* Peck, *Mesochara sp.* a*ff. M. mongolica* Karezewska and Ziembinska-Towrzydlo, *Maedlerisphaera sp. aff. M. pseudoulmensis* Karezewska and Ziembinska-Tworzydlo, *Sphaerochara sp.*, and *Tectochara sp.*

SUMMARY

Maedlerisphaera arabica , a new fossil species of Charophyta from the subsurface Upper Cretaceous (pre-Coniacian) rocks of southeastern Iraq is described .

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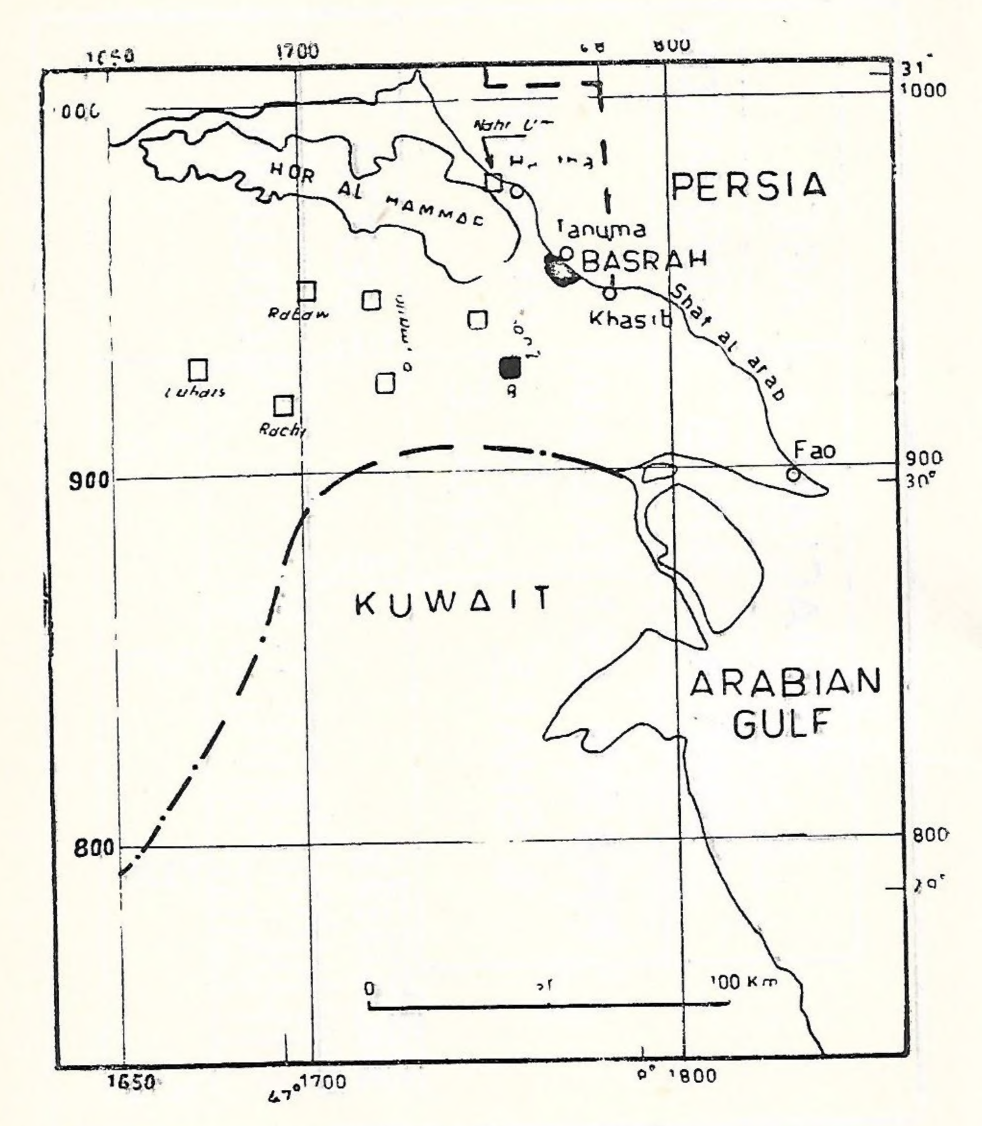
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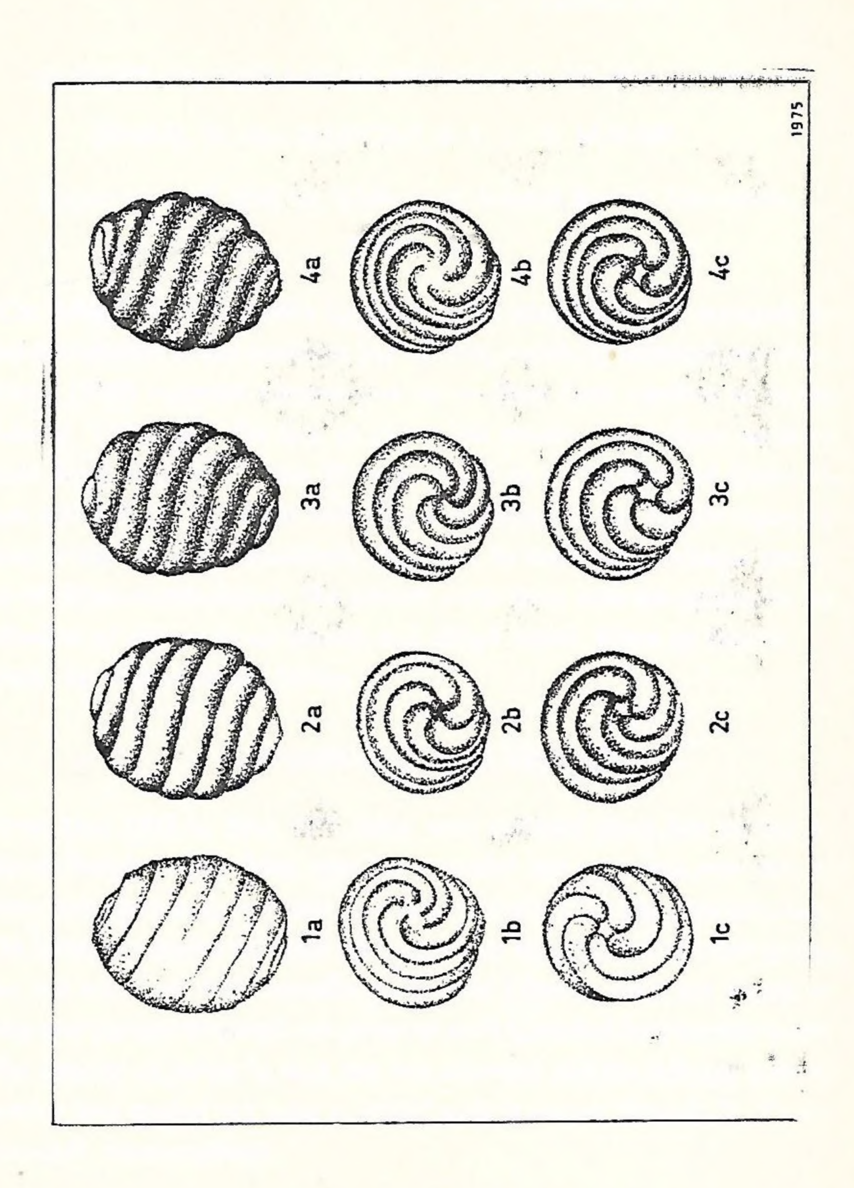
(Manuscript received on May 22,1975)

AGE	FORMATION	MEMBER	DEPTH	COLUMN
CONIACIAN	SHAT AL ARAB	TANUMA & SHALE	7120 – 7225	7170
		KHASIB LST & SHALE	7225 – 7370	7270
			7370, 7380, 7390, 7400, 7410, 7420, 7430, 7440, 7450, 7460, 7470	7370, 7470

TEXT-FIGURE 1



LOCALITY MAP



TEXT-FIGURE 2

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SURVEY ON NEMATODE INFECTION OF IRAQI FISHES

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The fishes from the families Cyprinidae and Mugilidae were surveyed for fish-nematodes in the southern part of Iraq especially inBasrah marshes. Khalil (1969) reported *Contracaeum* larvae from *Latis nilotious* in Sudan. Herzog (1969) was the first to report the presence of various parasites from Iraqi freshwater fishes. Shamsuddin *et al.* (1971) reported *Contracaeum* larvae from *Mugil abu* and *Silurus triostegus* in the middle region of Iraq. It was therefore considered important to study the nematode parasites of fishes in this region. The present work deals with the studies on the infection of *Aspius vorax* Heckel and *Mugil hishni* Misra in Basrah water by *Contracaeum* larvae.

MATERIAL AND METHOD

From May 1972 to June 1973 fishes were collected from fish market in Basrah.Weights of the fishes were first recorded and the scales were removed from each specimen, and kept in a small envelops for age determination. The larval nematodes collected from the fishes were divided into two groups, the first was fixed with formalin-acetic acid (Thorne 1961) for identification, and the second group was preseved in 70%alcohol for parasites count. The number of larvae in each fish was recorded and the fish-age determination was carried out using a special scale projector (Basrah 73, Yassin, personal comunication).

The calculations were made and the relation of age–weight, age–infection, and weight–infection were determined.At test was used in analysing the data The larval nematodes was identified as *Contracaeum* sp. by L.F. Khalil of the Commonwealth Institute of Helminthology. The *Contracaeum* larvae were found attached to the external surface of the alimentary canal and the mesentries.

RESULTS AND DISCUSSION

The results of the age–weight, age-infection, and weight infection analyses made on *A. vorax* and *M. hishni*, 50 spceimens each, are presenied below .

Age :

Fishes were divided into four age groups, namely, 0, 1, 2, and 3 representing 0, 1, 2. and 3 years old respictively (0=less than 1 year). Weight infection relationship was studied for each age group

Tables 1 and 2 present the relation between age groups and weight for *A. vorax* and *M, hishni*, respectively. Table 1 shows that *A. vorax* infection incidence increased with the length of fish (age) and highly significant differences were found at age 2 and 3 (P=0.001). It is the same for *M. hishni* (Table 2, P2=0.05),the infection incidence increases up to the age of 2, but then it drops. This decrease of infection incidence with the increase of fish length may be due to the development of resistance with aging, as suggested by Khalil (1969), or owing to the death of already infected fishes in group 2 and the resultant survival of non–infected fishes. Figures 1 and 2 show weight, age, and infection incidence relationships for *A.vorax* and *M. hishni* respectively.

Weight:

Fishes of both species were grouped according to their weight and the weight infection relationships were determined for each group. Tables 3 and 4 show the weight–infection relationship for *A. vorax* and *M. hishni*

respectively. In *A. vorax,* the infection increased with the weight up to the group weighting 300–400 g. The significant differences were found to be (P=0.001). Regarding *M. hishni,* the infection increased rapidly with weight groups until it reached the second group weighing 20–30g and then decreased gradually. However, there was no significant difference.

Figure 3 shows the weight–infection relationship within the weight groups.

Table 1.

A. vorax : Age–Infcetion relationship.

Age group	Frequency	Nean No. of Nematodes
0	1	1.0
1	3	10.6
11	43	11.1
111	3	21.0

Table 2

M. hishni: Age–Infcetion relationship

Age group	Frequency	Mean No. of Nematodes
0	1	1.0
1	28	5.1
11	14	8.0
111	6	4.4

Table 3

A. vorax: Weight–Infection relationship

Group	weight (gram)	Frequency	Nean No. of Nematodes
1	200–300	14	7.7
11	300–400	21	15.9
111	over 400	14	7.9

Table 4

M. hishni: Weight–Infection relationship

Group	Weight (gram)	Frequency	Mean No. of Nematodes
1	10–20	8	3.0
11	20–30	11	10.1
111	30–40	32	4.4
IV	over 40	4	3.0

ACKNOWLEDGEMENTS

We would like to thank Dr. L.F. Khalil of the Commonwealth Institute of Helminthology for his help in the identification of the Nematode, and Mr.K.Yassin of the Basrah University for letting us using his scale projector. We are ndebted to the University of Basrah for a financial support.

SUMMARY

A. vorax and *M. hishni* were surveyed for the infection with *Contracaeum* sp. larvae, in Basrah waters.

It was found that the infection increased with the age of the fish until second year in both *A. vorax* and *M. hishni* and then dropped .While in case of the weight the infection increased between 300 and 400 g in *A. vorax* and 20–30 g in *M. hishni* and then decreased.

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الخلاصة

يتضمن هذا البحث مسح لاصابة اسماك الخشني والشلج بيرقات الديدان الخيطية المعروفة باسم *Contracaeum* sp. في مياه شط العرب والأهوار المجاورة لمحافظة البصرة .
وقد وجد بان الاصابة بالديدان تزداد بازدياد عمر السمكة حتى السنة الثانية ثم تقل بعد ذلك بالنسبة لاسماك الخشني والشلج .

وكذلك وجد بأن الاصابة تزداد كلما ازداد وزن السمكة حتى يصل مابين ٣٠٠ ـ ٤٠٠ غرام حيث يكون اعلى نسبة من الاصابة بالنسبة لسمكة الشلج ثم يقل بعد ذلك . أما بالنسبة لسمكة الخشني فإن الاصابة ترداد كلما ازداد وزن السمكة حتى يصل مابين ٢٠ ـ ٣٠ غرام حيث يكون أعلى نسبة من الاصابة ثم يقل بعد ذلك .

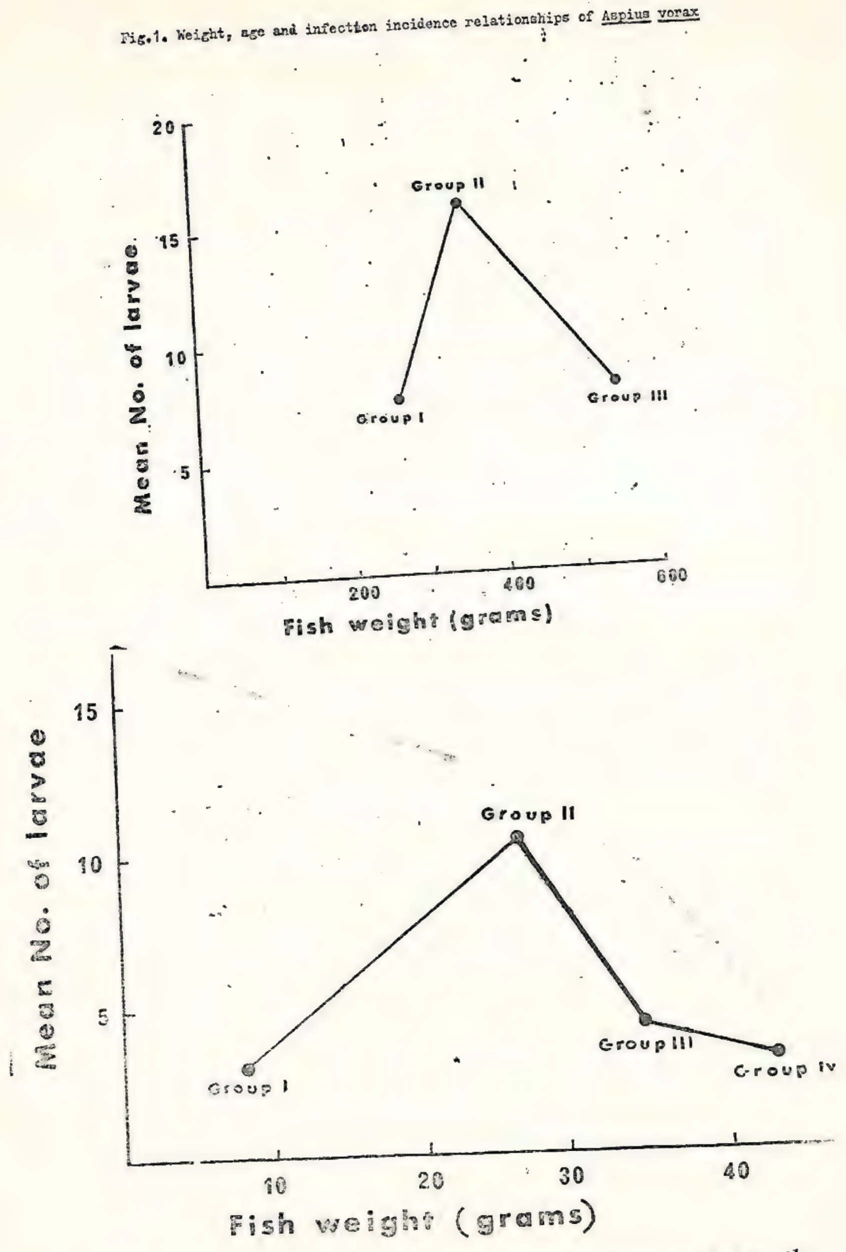


Fig. 1. Weight, age and infection incidence relationships of Aspius vorax

Fig. 2. Weight, age and infection incidenee relationships of *Mugil hishni*.

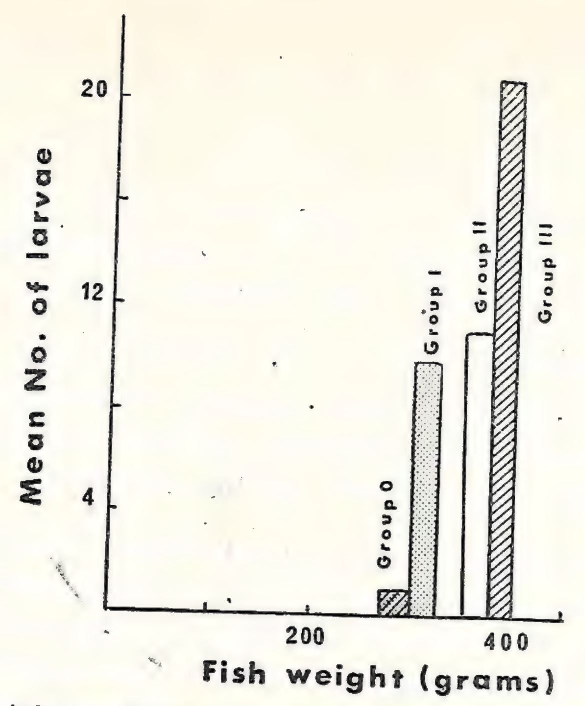


Fig.3. Weight-infection relationships with in the weight groups of *Aspius vorax*

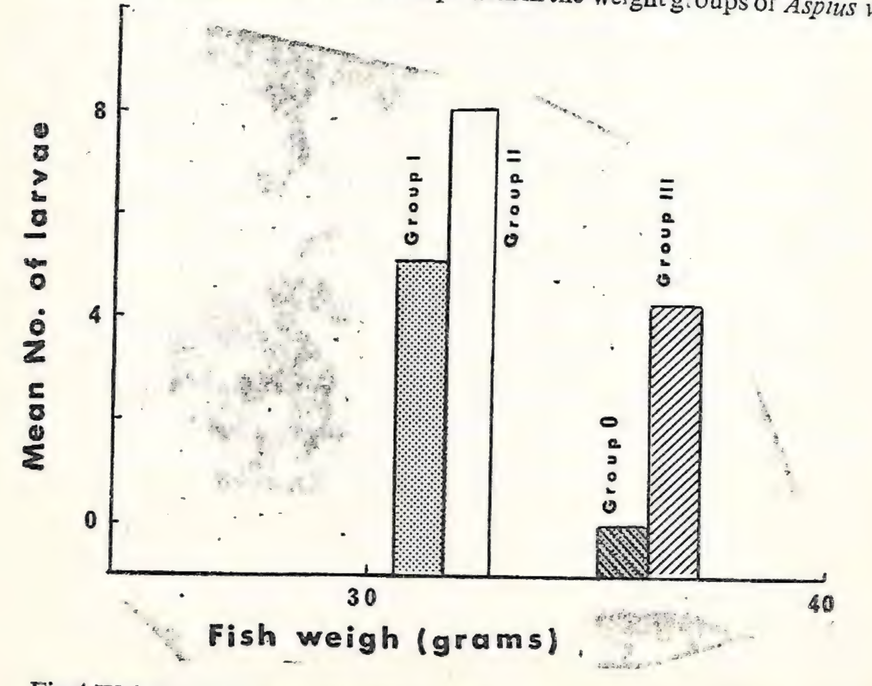


Fig.4. Weight-infection relationships within the weight groups of *Mugil hishni.*

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EFFECT OF CERTAIN FERTILIZERS, FEEDS AND COBALT CHLORIDE ON THE PRODUCTION AND SURVIVAL OF YOUNG ONES OF THE COMMON CARP *CYPRINUS CARPIO* L.

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Application of suitable fertilizers and feeds is of vital importance in enhancing production and survival of fish in ponds . Some important works in this regard are those of Schaeperclaus (1933), Hora (1943) , Alikunhi *et al.* (1955) Alikunhi (1957), Das and Krishnamurthy (1961), Hora and Pillay (1962),Report of the Fish Seed Committee Government of India (Anon 1966) , Lakshmanan *et al.* (1968) , Rabanal (1968) , Swingle (1968) , Sen (1972) and Ghosh (1972) have stressed the role of cobalt in augmenting production and survival of fish . A perusal of the literature reveals that a large number of authors have devoted their attention to the culture of fry and fingerlings in field conditions with emphasis on nursery managment. Inspite of this the per hectare (ha) production of the Table – sized fish is alarmingly low in India. We have observed that common carp (*Cyprinus carpio* L.) although breeds in ponds in the usual course, its growth and survival remained poor. Very heavy mortality was observed in the spawn and fry stages resulting in low production. Therefore, the authors have attempted to try out certain fertilizers and feeds for enhancing production and survival of the common carp young ones.

MATERIALS AND METHODS

Under the present study four-day old mixed hatchlings of common carp (*Cyprinus carpio communis* L. and *Cyprinus carpio specularis* L.)of similar

parentage were reared for 46 days at the Kaithoon Fish Farm, Kota, Rajasthan, India in eight nursery ponds each with an area of 0.028 ha with almost identical conditions initially.

For convenience in study and comparison the nursery ponds were divided into four groups: Group I included pond nos. 1 and 2; II, 3 and 4; III, 5 and 6 and IV, 7 and 8.

Group I was fertilized with ammonium sulphate while those of groups II and III with deep litter fertilizer from poultry a week ahead of the introduction of common carp hatchlings. The young ones in all the nursery ponds were fed daily on a mixture of rice bran and ground nut oil cake in the ratio of 1:1 by weight. Ponds of group II and IV were also provided with cobalt chloride daily (Table 1).

Table 1

Average quantity of feed, fertilizers and cobalt chloride supplied in each group in kg

Group	Rice bran and ground nut oil cake	Cobalt chloride	Ammonium sulphate	Deep litter fertilizer
I	48.0	nil	2.0	nil
II	32.0	0.256	nil	500
III	40.0	nil	nil	500
IV	50.0	0.256	nil	nil

The feed in ponds was put in plastic tubs about one foot deep below the level of water at suitable places. Fresh ration was supplied only when the previous quantity was found to be consumed. The cobalt chloride was first made into solution with water and sprinkled in the various ponds. Records of air, water temperatures and oxygen contents were kept weekly.

RESULTS

In nursery ponds, highest production by weight was achieved in group III (*c.* 535 kg/ha), followed by group II (*c.* 362 kg/ha). Production in group IV came next (*c.* 258 kg/ha) closely followed by group I (*c.* 248 kg/ha) as given in Table 2.

Table 2

Number of hatchlings stocked, percentage survival and rate of production of common carp

Group	Pond	Hatchling stocked	Total no. harve-sted	Survival %	Production (kg)		
					Total production	Produc tion per ha.	Average production per ha
I	1	12000	2000	16.60	6.96	248.50	248
	2	12000	1945	16.20	6.90	247.90	
II	3	12000	2090	17.40	10.00	357.14	362
	4	12000	2150	17.90	10.30	367.80	
III	5	12000	1404	11.70	15.02	536.40	535
	6	12000	1395	11.62	14.92	532.80	
IV	7	12000	1906	15.88	7.24	258.5	258
	8	12000	1900	15.84	7.21	257.5	

The lowest percentage of survival (11.6) has accompanied with the highest production (in group III). The data given in Table II clearly indicate a steady fall in the survival rate with the increase in production rate, though the same does not hold true for group II where survival percentage was 17.6.

DISCUSSION

It is reported that cobalt chloride is a growth- promoting substance and is used as an additive to the feed of developing fry. It raised the survival rate also to a large extent. Sen (1972) reported very satisfactory results reg arding survival and growth of Indian major carp fry by the use of cobalt chloride. Ghosh (1972) also found that the growth and survival rates of *Mugil parsia* increased with cobalt chloride. Since both these reports were in abstract form further details could not be ascertained.

However in our experiments, although, the total production per ha was quite encouraging the survival percentage remained very poor. This was rather curious in view of the role of cobalt chloride in enhancing survival as advocated by certain workers (*op. cit.*). However, poor survival was due to a variety of reasons. Cannibalism was observed particularly in the younger stages of common carp. This phenomenon was induced as a result of the heterogenous growth of the developing young ones. Wide fluctuations in temperature were also largely responsible for mass mortality.

Group III showed the highest production. This is obviously due to the fact that deep litter fertilizer was employed in the initial preparation of these ponds. This fertilizer is a by-product from poultry and is one of the most valuable organic fertilizers available (McArdle and Panda 1965, Anon 1961). Nandy *et al.* (1972) reported a sustained growth of zooplankters by the application of poultry droppings along with Mahua (*Madhuca latifolia*) oil cake, cowdung and urea in the ratio of 1 :6:3 which at 1000 ppm proved useful.

When group II was compared with group III we found that in both of them an equal amount of deep litter fertilizer was added. But in addition to this,